

PATENT ABSTRACTS OF JAPAN

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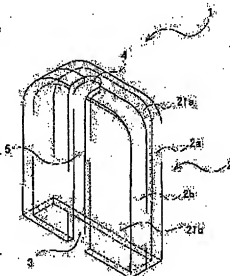
(72)Inventor : ISHIDA NOBORU

(54) HARD HOLDER FOR LEUKOCYTE REMOVER

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a hard holder to be mounted on a leukocyte remover with a housing made from a soft resin so as to enable filtering properly in the leukocyte remover.

SOLUTION: The hard holder 1 is mounted on the leukocyte remover 40 provided with a bag-shaped housing 24 made from a soft resin, a filter member 5 for removing leukocytes, a port 46 for flooding bloods and a port 47 for draining bloods. In this case, the hard holder 1 is provided with a main body 2 for housing the remover 40, the main body 2 is provided with opposing planar parts 2a and 2b which come into contact with the remover when being used and are formed so as to be almost parallel with each other. The distance between the opposing planar parts 21a and 21b in the main body 2 is larger than the thickness of the remover 40 or more.



LEGAL STATUS

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CLAIMS

[Claim(s)]

[Claim 1] Letter housing of elasticity resin bag manufacture, and the filter member for leukopheresis prepared so that the inside of this housing might be classified into an inflow side blood room and an outflow side blood room, It is a leukopheresis dexterous hard electrode holder for containing a leukopheresis machine equipped with said inflow side blood room, the blood inflow port open for free passage, and said outflow side blood room and a blood outflow port open for free passage. This hard electrode holder is equipped with the body section for containing said leukopheresis machine. This body section Spacing of the plate-like part in which it has the plate-like part in contact with a leukopheresis machine which was formed almost in parallel, and which faces each other at the time of use, and this body section faces it is a leukopheresis dexterous hard electrode holder characterized by having become more than the thickness of said leukopheresis machine.

[Claim 2] Said leukopheresis dexterous hard electrode holder is a leukopheresis dexterous hard electrode holder [equipped with the notching section for induction for induction of the tube connected to said port or this port which extends from opening for leukopheresis machine insertion prepared in the end, the penetration section which can penetrate the tube which is prepared in an other end side and connected to said port or this port of said leukopheresis machine, and this penetration section to said opening] according to claim 1.

[Claim 3] Opening for leukopheresis machine insertion to which said leukopheresis dexterous hard electrode holder is located in the side edge of said plate-like part which faces each other, The upper limit side penetration section which can penetrate the tube which is prepared in upper limit and connected to said port or this port of said leukopheresis machine, The lower limit side penetration section which can penetrate the tube which is prepared in a lower limit and connected to said port or this port of said leukopheresis machine, The notching section for upper limit side induction for induction of the tube connected to said port or this port which extends from said upper limit side penetration section to said opening. It is a leukopheresis dexterous hard electrode holder to claim 1 equipped with the notching section for lower limit side induction for induction of the tube connected to said port or this port which extends from said lower limit side penetration section to said opening.

[Claim 4] Opening for leukopheresis machine insertion to which said leukopheresis dexterous hard electrode holder is located in the side edge of said plate-like part which faces each other, The bottom penetration section which can penetrate the tube which is prepared near the center section of the upper plate-like part, and is connected to said port or this port of said leukopheresis machine, The bottom penetration section which can penetrate the tube which is prepared near the center section of the lower plate-like part, and is connected to said port or this port of said leukopheresis machine, The notching section for bottom induction for induction of the tube connected to said port or this port which extends from said bottom penetration section to said opening. A leukopheresis dexterous hard electrode holder [equipped with the notching section for bottom induction for induction of the tube connected to said port or this port which extends from said bottom penetration section to said opening] according to claim 1.

[Claim 5] said body section — the 1st monotonous section — this, while being supported to revolve by the 1st monotonous section possible [closing motion] It has the 2nd monotonous section which becomes almost parallel to said 1st monotonous section in the state of obstruction which contains said leukopheresis machine. Further said body section In the state of said leukopheresis machine receipt A leukopheresis dexterous hard electrode holder [equipped with the lower limit side penetration section which can penetrate the tube connected to said port or this port of the upper limit side penetration section which can penetrate the tube connected to said port or this port of said leukopheresis machine, and said leukopheresis machine] according to claim 1.

[Claim 6] said body section — the 1st monotonous section — this, while it is removable in the 1st monotonous section It has the 2nd monotonous section which becomes almost parallel to said 1st monotonous section in the state of wearing which contains said leukopheresis machine.

Further said body section in the state of said leukopheresis machine receipt A leukopheresis dexterous hard electrode holder [equipped with the lower limit side penetration section which can penetrate the tube, connected to said port or this port of the upper limit side penetration section which can penetrate the tube connected to said port or this port of said leukopheresis machine, and said leukopheresis machine] according to claim 1.

[Claim 7] Said hard electrode holder is a leukopheresis dexterous hard electrode holder according to claim 1 to 6 which equips the inside with the letter object of a projection.

[Claim 8] Said hard electrode holder is a leukopheresis dexterous hard electrode holder according to claim 1 to 6 which equips the inside with the rib.

[Claim 9] Said letter object of a projection or rib is a leukopheresis dexterous hard electrode holder according to claim 7 or 8 arranged along the direction where the liquid which passes through the inside of said leukopheresis machine flows.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the hard electrode holder for containing the electrode holder which contains a leukopheresis machine, and the leukopheresis machine whose housing is a product made of elasticity resin especially.

[0002]

[Description of the Prior Art] Conventionally, as a leukopheresis machine, there is a thing equipped with housing, the filter member prepared so that the inside of this housing might be classified into an inflow side blood room and an outflow side blood room, an inflow side blood room and a blood inflow port open for free passage, and an outflow side blood room and a blood outflow port open for free passage. Among these, in the leukopheresis machine which has housing produced with elasticity resin, when a leukopheresis machine was accidentally pressed during filtration of blood, or after filtration, since housing was soft, the discard removed by the filtration till then might flow out.

[0003] Moreover, since housing made of elasticity resin would be extended and an inflow side blood room would be covered with a lot of filtered matter when the filtered matter flows in a leukopheresis machine, fall of the liquid within a leukopheresis machine could not be maintained, but there was a possibility that the pressure by which the filtered matter is stuffed as a result into a filtering medium might become small, and filtration velocity might become slow. Furthermore, the leucocyte recovery set which equips JP,11-206875,A with the leukopheresis machine which has housing produced with elasticity resin, and the hard stowage container for containing it is indicated. Specifically, these are collecting leucocytes moderately the capacity of the leukopheresis machine which dipped blood inside, and by regulating the capacity of an inflow side blood room.

[0004] However, where a leukopheresis machine is compressed, in order to contain a leucocyte recovery set given in JP,11-206875,A in a hard container, even if housing made of elasticity resin and a leukopheresis filter stick it and it dips blood in a leukopheresis machine, it will bar circulation of the blood in a leukopheresis machine, and will cause the fall of filtration velocity. When a filter member was a porous body and it contained in the hard container especially where a removal machine is compressed, the hole of a porous body was crushed and there was a possibility that blood might stop flowing into a filter.

[0005]

[Problem(s) to be Solved by the Invention] Since the conventional hard electrode holder was produced by a leukopheresis machine and one in many cases, where a leukopheresis machine is equipped with a hard electrode holder, from the case of only a leukopheresis machine, ** of a product became high and it had led to the increment in an transportation cost. Furthermore, since it fixed by thermal melting arrival, adhesion, or the screw stop and had equipped with the hard electrode holder beforehand produced with injection molding etc. for every leukopheresis machine, the wearing process became complicated and it had led to the manufacture increase in cost. Moreover, in the conventional hard electrode holder, since it was difficult to remove after equipping a leukopheresis machine, after [both of] filtration use will be discarded collectively, and had produced problems, such as an increment in the amount of trash. Then, the hard electrode holder which equips the leukopheresis machine which has housing made of elasticity resin, and enables suitable filtration of a leukopheresis machine, and the leukopheresis machine which has housing made of elasticity resin before use can be easily equipped with the purpose of this invention, and after use has it in offering the hard electrode holder which can be easily removed from a leukopheresis machine.

[0006]

[Means for Solving the Problem] It is the leukopheresis dexterous hard electrode holder for containing a leukopheresis machine equipped with letter housing of elasticity resin bag manufacture, the filter member for leukopheresis prepared so that the inside of this housing might be classified into an inflow side blood room and an outflow side blood room, said inflow side

blood room and a blood inflow port open for free passage, and said outflow side blood room and a blood outflow port open for free passage an electrode holder attains the above-mentioned purpose. And this hard electrode holder is equipped with the body section for containing said leukopheresis machine, this body section is equipped with the plate-like part which contacts a leukopheresis machine at the time of use, which was formed almost in parallel and which faces each other, and spacing of the plate-like part which this body section faces has become more than the thickness of said leukopheresis machine.

[0007] And as for said leukopheresis dexterous hard electrode holder, it is desirable to have the notching section for induction for induction of the tube connected to said port or this port which extends from opening for leukopheresis machine insertion prepared in the end, the penetration section which can penetrate the tube which is prepared in an other end side and connected to said port or this port of said leukopheresis machine, and this penetration section to said opening. Moreover, opening for leukopheresis machine insertion to which said leukopheresis dexterous hard electrode holder is located in the side edge of said plate-like part which faces each other, The upper limit side penetration section which can penetrate the tube which is prepared in upper limit and connected to said port or this port of said leukopheresis machine, The lower limit side penetration section which can penetrate the tube which is prepared in a lower limit and connected to said port or this port of said leukopheresis machine, The notching section for upper limit side induction for induction of the tube connected to said port or this port which extends from said upper limit side penetration section to said opening, It is desirable to have the notching section for lower limit side induction for induction of the tube connected to said port or this port which extends from said lower limit side penetration section to said opening.

[0008] Furthermore, said leukopheresis dexterous hard electrode holder Opening for leukopheresis machine insertion located in the side edge of said plate-like part which faces each other, The bottom penetration section which can penetrate the tube which is prepared near the center section of the upper plate-like part, and is connected to said port or this port of said leukopheresis machine, The bottom penetration section which can penetrate the tube which is prepared near the center section of the lower plate-like part, and is connected to said port or this port of said leukopheresis machine, The notching section for bottom induction for induction of the tube connected to said port or this port which extends from said bottom penetration section to said opening, It is desirable to have the notching section for bottom induction for induction of said tube connected to said port or this port which extends from said bottom penetration section to said opening, moreover, said body section — the 1st monotonous section — this, while being supported to revolve by the 1st monotonous section possible [closing motion] It has the 2nd monotonous section which becomes almost parallel to said 1st monotonous section in the state of obstruction which contains said leukopheresis machine. Further said body section in the state of said leukopheresis machine receipt, it is desirable to have the lower limit side penetration section which can penetrate the tube connected to said port or this port of the upper limit side penetration section which can penetrate the tube connected to said port or this port of said leukopheresis machine, and said leukopheresis machine, moreover, said body section — the 1st monotonous section — this, while it is removable in the 1st monotonous section It has the 2nd monotonous section which becomes almost parallel to said 1st monotonous section in the state of wearing which contains said leukopheresis machine. Further said body section in the state of said leukopheresis machine receipt, it is desirable to have the lower limit side penetration section which can penetrate the tube connected to said port or this port of the upper limit side penetration section which can penetrate the tube connected to said port or this port of said leukopheresis machine, and said leukopheresis machine.

[0009] Moreover, as for said hard electrode holder, it is desirable to equip the inside with the letter object of a projection. Moreover, as for said hard electrode holder, it is desirable to equip the inside with the rib. Moreover, as for said letter object of a projection or rib, it is desirable to be arranged along the direction where the liquid which passes through the inside of said leukopheresis machine flows.

[0010]

[0011] The leukopheresis dexterosus hard electrode holder 1 of this invention is for equipping the leukopheresis machine 40 made of elasticity resin. The leukopheresis machine 40 is equipped with the outflow side blood room 44 and the blood outflow port 47 open for free passage by being prepared in the letter housing 42 of elasticity resin bag manufacture, filter member [which was prepared so that the inside of housing 42 might be classified into the inflow side blood room, 43 and the outflow side blood room 44] 45 for leukopheresis, inflow side blood room 43 and blood inflow port 46 open for free passage, and other end side of housing 42. The leukopheresis dexterosus hard electrode holder 1 is equipped with the body section 2 for containing saccate housing 42 part of the leukopheresis machine 40. And the body section 2 Having the plate-like parts 21a and 21b in contact with both sides of the letter housing 42 of elasticity resin bag manufacture of a leukopheresis machine which were formed almost in parallel and which face each other at the time of use (at the time of a blood inflow), spacing of the plate-like parts 21a and 21b which the body section 2 faces has become more than the thickness of the leukopheresis machine 40. Moreover, the opening 3 for leukopheresis machine insertion by which the leukopheresis dexterosus hard electrode holder 1 was formed in the end, The penetration section 4 which can penetrate the tube 416 which is prepared in an other end side and connected to the blood inflow port 48 or the blood inflow port 48 of the leukopheresis machine 40, It has the notching section 5 for induction for induction of the tube 416 connected to the blood inflow port 48 or the blood outflow port 46 which extends from the penetration section 4 to opening 3.

[0013] With this leukopheresis vessel 40, as shown in drawing 6, drawing 8, and drawing 10, two or more ribs 423 prolonged almost in parallel with an other end side (if it puts in another way flow direction of blood) than the end side of housing 42 are formed in inside 42a of the outflow side blood room side sheet 422. While preventing adhesion with the filter member 45 for

leukopheresis, and inside 42a of the outflow side sheet 422 by forming such a rib 423, the operation which guides filtration blood to an outflow port is demonstrated. About 1-5mm is suitable for spacing of two or more ribs 423, and the rib 423 serves as regular intervals mostly. Moreover, about 0.5-1mm is suitable for the width of face of a rib 423. 0.2-2mm is suitable for the height (difference of elevation) of a rib 423, and 0.5-1mm is suitable for it especially. Moreover, the shape of a triangular pyramid and the thing to which width of face becomes narrow toward a tip how hemispherical are suitable for the configuration of a rib 423.

[0014] Furthermore, in inside 42a of the outflow side sheet 422, you may have two or more longitudinal ribs 423 prolonged in an other end side from the end side of housing 42, and two or more transverse ribs 424 which intersect an abbreviation right angle at a longitudinal rib 423 like the leukopheresis machine 50 of the example shown in drawing 13 and drawing 14. In this case, about 1-5mm is suitable for spacing of a longitudinal rib 423 and a transverse rib 424, and, as for these ribs, it is desirable that they are regular intervals mostly. Moreover, about 0.5-1mm is suitable for the width of face of a longitudinal rib 423 and a transverse rib 424. 0.2-2mm is suitable for the height (difference of elevation) of a longitudinal rib 423, and 0.5-1mm is suitable for it especially. Moreover, 0.2-1mm is suitable for the height (difference of elevation) of a transverse rib 424, and 0.2-0.5mm is suitable for it especially. And as for the height of a transverse rib 424, it is desirable that it is lower than a longitudinal rib 423, and, specifically, the thing low about 0.3-1mm of the height of a transverse rib 424 is more desirable than a longitudinal rib 423. Furthermore, as for spacing of a transverse rib 424, it is desirable that it is larger than spacing of a longitudinal rib 423. Specifically, the thing large about 1-2mm of spacing of a transverse rib 424 is more desirable than spacing of a longitudinal rib 423.

[0015] And with this leukopheresis vessel 40, the filter member 45 for leukopheresis becomes the sheet-like frame 451 made of thermoplastic elasticity resin, and a frame 451 from the filtration function part material 452 which fixed directly [the periphery section] or indirectly. The filtration function part material 452 is formed with the laminated material of two or more filtering media. The filter member 45 for leukopheresis used here is equipped at least with the filtration function part which the filtration function part material 452 forms, and the non-filtering function part formed in the periphery perimeter like a filtration function part. And the filter member 45 for leukopheresis is in the condition of having been inserted between the thermoplastic elasticity resin sheets of two sheets, and thermal melting arrival of the periphery section of the sheet-like frame 451 made of thermoplastic elasticity resin is further carried out to the thermoplastic elasticity resin sheet of two sheets. Thereby, the filter member 45 for leukopheresis has classified the space in the thermoplastic elasticity resin sheet 421 of two sheets, and 422 (inside of housing 42) into the inflow side blood room 43 and the outflow side blood room 44. And if the elasticity resin tube which constitutes the blood inflow port 46 puts in another way so that it may be open for free passage with the inflow side blood room 43, thermal melting arrival is carried out to the center section by the side of the end between the thermoplastic elasticity resin sheets of two sheets (upper limit side) so that end opening of an elasticity resin tube may carry out opening into the inflow side blood room 43. If it puts in another way so that similarly the elasticity resin tube which constitutes the blood outflow port 47 may be open for free passage with the outflow side blood room 44, thermal melting arrival is carried out to the center section by the side of the other end between the thermoplastic elasticity resin sheets of two sheets (lower limit side) so that end opening of an elasticity resin tube may carry out opening into the outflow side blood room 44.

[0016] With this leukopheresis vessel 40, especially the filter member 45 for leukopheresis Short band-like extension section 451a to which the sheet-like frame 451 made of thermoplastic elasticity resin projects in the method of outside in a center section and the center section by the side of the other end (lower limit side) by the side of an end (upper limit side) as shown in drawing 11. The elasticity resin tube which is equipped with 451b and constitutes the blood inflow port 46 The elasticity resin tube which welding is carried out to sheets 421 and 422 so that it may be located between extension section 451a and the inflow side resin sheet 421, and constitutes the blood outflow port 47 Welding is carried out to sheets 421 and 422 so that it may be located between extension section 451b and the outflow side resin sheet 422, and thereby,

the blood inflow port 46 is open for free passage only with the inflow side blood room 43, and is opening the blood outflow port 47 for free passage only with the outflow side blood room 44. And the tube 417 for discharging the tube 416 for introducing the filtered matter (not shown) and filtrate (not shown) is connected to the leukopheresis machine in the blood inflow port 46 and the blood outflow port 47, respectively. Thereby, a tube 416 is open for free passage with the inflow side blood room 43 through the blood inflow port 46, and is opening the tube 417 for free passage with the outflow side blood room 44 through the blood outflow port 47. Connection of tubes 416 and 417, the blood inflow port 46, and the blood outflow port 47 is made by inserting and welding tubes 416 and 417 inside the elasticity tube which constitutes ports 416 and 417. For this reason, as for the outer diameter of a tube, it is desirable to be produced by the almost same magnitude as the bore of a port. the resin used for the blood inflow port 46 and the blood outflow port 47 as a formation ingredient of a tube — desirable — among these, the blood inflow port 46 and the blood outflow port 47, and welding — easy resin is desirable.

[0017] Moreover, on the outside [broken line / which is shown in drawing 11], welding of the filter member 45 for leukopheresis is carried out to housing 42 (between the thermoplastic elasticity resin sheet 421 of two sheets, and 422). For this reason, the leukopheresis machine 40 is equipped with the blood passage 426 formed of between housing insides with the part where at least a filtration function part does not contact 452 at the periphery section of the outflow side blood room 44 (about the part which in other words does not have a filtration function, and a non-filtering function part). Similarly, the leukopheresis machine 40 is equipped with the part where at least a filtration function part does not contact 452 at the periphery section of the inflow side blood room 43, the part which in other words does not have a filtration function, and a non-filtering function part and the blood passage 427 formed of between housing insides. By having such a non-filtering function part and the blood passage formed of between the insides of housing 42 in the periphery section in housing, circulation of the blood in the periphery section of the housing 42 interior is made good, and the residual blood in the periphery section is prevented. Furthermore, since the filtration blood which flowed the passage 425 between ribs 423 when such blood passage existed near [in the outflow side blood room 44 / blood outflow port 47] is guided to the blood outflow port 47 good, the falls of filtration velocity are fewer things. And as for a leukopheresis machine, it is desirable to have suspended Ayr 5ml or more. Flexible thermoplastics is used as a formation ingredient of the thermoplastic elasticity resin sheets 421 and 422 which constitute housing 42, the sheet-like frame 451 made of thermoplastic elasticity resin of the filter member 45 for leukopheresis, the blood inflow port 46, and the blood outflow port 47.

[0018] Fixing of the thermoplastic elasticity resin sheets 421 and 422 which constitute housing 42, the sheet-like frame 451 made of thermoplastic elasticity resin of the filter member 45 for leukopheresis, the blood inflow port 46, and the blood outflow port 47 has the desirable welding which does not use adhesives. Internal joining by heat tracing joining by heat sealing, the high frequency welder, and the ultrasonic welder is sufficient as joining. Moreover, even if the approach of joining carries out welding of all the above-mentioned members to coincidence, it may divide a step and may perform it.

[0019] And 452 is the laminated material of two or more filtering media with which at least the filtration function part of the filter member 45 for leukopheresis consists of a porous body or a nonwoven fabric. Specifically, the laminating of the filtering media 452a, 452b, 452c, 452d, 452e, and 452f of six sheets is carried out. In addition, as laminating number of sheets of a filtering medium, 2-10 sheets are suitable. And In this example, since there is much laminating number of sheets of a filtering medium, welding of how many outside periphery sections of the sheet-like frame 453 for welding assistance to which welding of that filtering medium (for example, 3-5 sheets) was carried out to the sheet-like frame 453 for welding assistance, and welding of the filtering medium was carried out to the inner circumference section of the sheet-like frame 451 made of thermoplastic elasticity resin. With the porous body used for 452, at least a filtration function part it is what means structure with dipping nature with the detailed hole of a large number which are open for free passage from one field to the field of another side. The porous body which consists of organic [of nature, composition, a semisynthesis and playback],

capacity of the inflow side blood room 43 is regulated, the pressure which the fall of the liquid (filtered matter) of the leukopheresis machine 40 interior is maintained, and stuffs the filtered matter into a filtering medium 452 increases, and filtration velocity improves. That is, by using this hard electrode holder 1, the leukopheresis machine 40 can be made into a condition near at the time of a non-blood inflow (a natural condition, intact condition) at the time of a blood inflow, and leukopheresis can be performed in the condition near morphology of design. In addition, the filtration velocity of the leukopheresis machine 40 can be adjusted by adjusting spacing of the plate-like parts 21a and 21b which the hard electrode holder 1 faces. In addition, the interior of the body section 2 cannot press a leukopheresis machine from the exterior at the time of use, and as long as spacing of the plate-like part which a hard electrode holder face be the die length which regulate the capacity of an inflow side blood room moderately above the thickness of a leukopheresis machine, it may be produce by what kind of configuration and magnitude. As for the magnitude inside the body section 2 of the hard electrode holder 1, it is desirable that the lay length to which the longitudinal direction of the increase of 0 - 3mm and drawing 1 and the die length of the longitudinal direction of the increase of 0 - 3mm and drawing 1 cross [spacing of the plate-like parts 21a and 21b which face each other] at right angles to the die length of a leukopheresis machine to the thickness of a leukopheresis machine is the increase of 0 - 3mm to the width of face of a leukopheresis machine.

[0024] The opening 3 for leukopheresis dexterous insertion is a part which inserts the leukopheresis machine 40 in the body section 2, and is formed in the lower limit side (end side) of the body section 2. Moreover, since opening 3 is produced more than the cross section of the A-A line cross section (drawing 8) of drawing 6, it can insert the leukopheresis machine 40 into the hard electrode holder 1 from the upper limit. In addition, you may enable it to insert a leukopheresis machine easily by producing in the shape of [which expands the diameter of the opening 3 neighborhood toward a lower limit] a taper.

[0025] The penetration section 4 is the part which can penetrate the tube 416 connected to the blood inflow port 46 or the blood inflow port 46 of the leukopheresis machine 40. The penetration section 4 serves as a part which the tube 416 connected to the blood inflow port 46 passes in case the leukopheresis machine 40 is equipped with the hard electrode holder 1, and, specifically, after wearing serves as a part which the blood inflow port 46 passes. For this reason, also in the condition of having equipped with the hard electrode holder, the filtered matter can be introduced in a leukopheresis machine. Moreover, in the example, although formed in the location corresponding to the blood inflow port 46 of the upper limit of the body section 2, if the penetration section 4 does not bar circulation of the liquid in the tube 416 connected to the blood inflow port 46 and the blood inflow port 46, it may be produced by what kind of location by the side of the blood inflow port 46 (upper limit of drawing 1). Moreover, although the penetration section 4 is produced in the example of this invention by the same round shape as the outer diameter of a port 46, it is not restricted to this but may be produced to elliptical etc. Moreover, as for the bore of the penetration section 4, it is desirable to produce to the outer diameter of a port 46 in magnitude of -1mm or more and less than +10mm. This is because a port 46 does not separate from the penetration section 4 even if large [even if narrower about 1mm than the outer diameter of a port 46, it is possible to pass the penetration section 4 because of the flexibility of a port 46, and elasticity, and] about 10mm. In addition, in the example, although the port 46 has penetrated the penetration section 4, it is not restricted to this, but where the leukopheresis machine 40 is equipped with a hard electrode holder, you may produce so that a tube 416 may penetrate. It is desirable that it is that by which the bore of the penetration section in this case is also produced by the magnitude of -1mm or more and less than +10mm to the outer diameter of a tube. In addition, in the example of this invention; although the penetration section 4 is formed in the upper limit of the body section 2 and opening 3 is formed in a lower limit, it is not restricted to this, and opening for insertion may be formed in upper limit, and the penetration section may be formed in a lower limit.

[0026] The notching section 5 for induction is prolonged from the penetration section 4 to opening 3, and in case it equips the leukopheresis machine 40 with a hard electrode holder, it serves as a part for guiding a tube 416 to the penetration section 4. Moreover, the notching

section 5 is formed in the outflow side blood room 44 side of the leukopheresis machine 40 of the body section 2 in a straight line from the penetration section 4 to opening 3. Thus, the notching section 5 was formed in outflow side blood room side 44 because housing 421 would overflow breadth or notching and the wall of the body section was not able to ensure capacity regulation, when the inflow side blood room 43 (housing 421) is extended if the notching section is formed in inflow side blood room side 43. In addition, the notching section may be produced so that it may be hard to separate not only from what is produced in a straight line as mentioned above but from the tube 416 from the notching section, and ups and downs etc. may be carried out in the middle of the opening 3 for insertion from the penetration section 4. In addition, as for the width of face of the notching section 5, it is desirable to produce to the outer diameter of a port 46 or a tube 416 in magnitude of -1mm or more and less than $+10\text{mm}$ for the same reason as the penetration section 4. In addition, the bore of the penetration section is larger than the outer diameter of a port, and being produced more narrowly than the outer diameter of a tube is [the width of face of the notching section] more desirable. Thus, by producing, while being hard coming to separate a tube from a hard electrode holder, the liquid flow which passes the tube connected to the port and the port is not barred.

[0027] Moreover, as for the thickness of the hard electrode holder 1, it is desirable that almost all parts are 2mm or more. This is because a hard electrode holder can extend by the escape of a leukopheresis machine and capacity regulation cannot be suitably performed, if thickness is thin even if it is the container produced by rigid resin. Moreover, it is with most because some hard electrode holders 1 can attain the above-mentioned purpose at least less than 2mm . For example, even if the thickness of the upper limit section of the hard electrode holder 1 shown in drawing 1 is less than 2mm , capacity regulation of a leukopheresis machine can be performed appropriately. As a formation ingredient of a hard electrode holder, although polypropylene, rigid polyvinyl chloride, polystyrene, polyethylene, etc. are used, it is polypropylene more preferably. In addition, the thickness of a hard electrode holder has 2-3 more desirable mm in the range of 2mm or more.

[0028] Moreover, as for the hard electrode holder 1, it is desirable to equip the inside with two or more letter objects of a projection (not shown). Moreover, as for the hard electrode holder 1, it is desirable to equip the inside with two or more ribs (not shown). These prevent adhesion with a leukopheresis machine and a hard electrode holder, and after use of a leukopheresis machine, they are prepared so that a hard electrode holder can be removed easily. In addition, as for the letter object of a projection and rib which were mentioned above, it is desirable to be arranged along the direction where the liquid which passes through the inside of a leukopheresis machine flows. This does not bar the liquid flow which passes through the inside of a leukopheresis machine. The shape of the shape of a cone and a multiple drill and a semi-sphere etc. is suitable for the configuration of the letter object of a projection, and it is especially desirable, [of the shape of a semi-sphere] $0.2\text{-}2\text{mm}$ is suitable for the height (difference of elevation) of a projection, and $0.5\text{-}1\text{mm}$ is suitable for it especially. Moreover, about $[0.5\text{-}10\text{mm}]$ two are suitable for the magnitude of the base of a projection. Moreover, although the number of projections is different with the area of base of a projection, 1cm distance of $1\text{-}10\text{mm}$ between about 3-50 per two and a projection is suitable for it. The shape of a triangular pyramid and the thing to which width of face becomes narrow toward a tip how hemispherical are suitable for the configuration of a rib. About $2\text{-}6\text{mm}$ is suitable for spacing of a rib, and the rib serves as regular intervals mostly. Moreover, about $1\text{-}3\text{mm}$ is suitable for the width of face of a rib, and about $1\text{-}3\text{mm}$ is suitable for the height of a rib.

[0029] Moreover, as for the hard electrode holder 1, being produced with resin with high transparency is desirable. It can check by this in what kind of condition the filtered matter is circulating, and when the filtered matter is got blocked, it can be coped with quickly. As resin with high transparency, polyolefine system resin, such as styrene resin, such as polystyrene and a styrene butylene copolymer, a polycarbonate, polypropylene, and polyethylene, etc. is used. In addition, as long as it can check the condition in a leukopheresis machine, it may be produced with resin that it does not need to be completely transparent and translucent.

[0030] Next, the manufacture approach of the hard electrode holder 1 of the example of this

invention is explained. First, injection molding of side front member 2a containing plate-like partial 21a of the hard electrode holder 1 and the background member 2b containing plate-like partial 21b is carried out separately. Next, it arranges so that the side which contains the leukopheresis machine 40 of a side and background member 2b which contains the leukopheresis machine 40 of side front member 2a may be turned inside and both may counter, and it is produced by joining a mutual periphery. Junction is performed by internal joining by the high frequency welder and the ultrasonic welder. In addition, you may join by preparing and screwing a screw hole in both a side front member, and background both [either or].

[0031] Next, the operation of the hard electrode holder 1 of the example of this invention is explained. First, the leukopheresis machine 40 is arranged under the hard electrode holder 1 in the condition of having turned the blood inflow port 46 up. Then, the tube 416 connected to the blood inflow port 46 is inserted in the notching section 5, and a tube 416 is guided to the penetration section 4. In this condition, the leukopheresis machine 40 is located just under the opening 3 for insertion, and the tube 416 by the side of the blood inflow port 46 passes the penetration section 4, and it is located inside the body section 2. Next, where the leukopheresis machine 40 is fixed, the hard electrode holder 1 is moved below, the leukopheresis machine 40 is inserted from the opening 3 for insertion, and the leukopheresis machine 40 is equipped with the hard electrode holder 1. What is necessary is on the other hand, just to perform the procedure of the wearing approach conversely, when removing the hard electrode holder 1 from the leukopheresis machine 40. As mentioned above, it has removed after filtration from the leukopheresis machine 40 easily while being able to equip the leukopheresis machine 40 with the hard electrode holder 1 easily before filtration.

[0032] Next, the leukopheresis dexterous hard electrode holder which are other examples of this invention is explained. Drawing 2 is the perspective view showing the white blood removal dexterous hard electrode holder which are other examples of this invention. The leukopheresis dexterous hard electrode holder 10 of this example It has the body section 12 for containing saccate housing 42 part of the leukopheresis machine 40. The body section 12 Having the plate-like parts 121a and 121b in contact with both sides of the letter housing 42 of elasticity resin bag manufacture of the leukopheresis machine 40 which were formed almost in parallel and which face each other at the time of use, spacing of the plate-like parts 121a and 121b which the body section 2 faces has become more than the thickness of the leukopheresis machine 40. Moreover, the opening 13 for leukopheresis machine insertion located in the side edge of the plate-like parts 121a and 121b which the leukopheresis dexterous hard electrode holder 10 faces. The upper limit side penetration section 14 which can penetrate the tube 416 which is prepared in upper limit and connected to the blood inflow port 46 or the blood inflow port 46 of the leukopheresis machine 40. The lower limit side penetration section 15 which can penetrate the tube 417 which is prepared in a lower limit and connected to the blood outflow port 47 or the blood outflow port 47 of the leukopheresis machine 40. It connects with the blood inflow port 46 or blood inflow port which extends from the upper limit side penetration section 14 to opening 13. The notching section 16 for upper limit side induction for induction of a tube 416. It has the notching section 17 for lower limit side induction for induction of the tube 417 connected to the blood outflow port 47 or blood outflow port which extends from the lower limit side penetration section 15 to opening 13.

[0033] The leukopheresis machine 40 mentioned above is used for the leukopheresis machine of this invention. The leukopheresis dexterous hard electrode holder 10 is equipped with the body section 12, the opening 13 for insertion, the upper limit side penetration section 14 and the lower limit side penetration section 15, and the notching section 16 for upper limit side induction and the notching section 17 for lower limit side induction. It is a part for the body section 12 to contain saccate housing 42 part of the leukopheresis machine 40 inside, and die length, width of face, and thickness are formed more greatly than saccate housing 42 part. For this reason, the hard electrode holder 10 can contain the leukopheresis machine 40 at the time of hard electrode-holder 10 wearing, without pressing the saccate housing 42 while being able to contain the whole housing 42 part. Moreover, since the thickness inside the hard electrode holder 10 is produced by the almost same configuration as the thickness of the saccate housing 42, the

leukopheresis machine 40 hardly moves within the hard electrode holder 10 after wearing. Moreover, in case the opening 13 for insertion of the body section 12 and the side which counters equip with the hard electrode holder 10, it is produced by the semi-cylindrical shape so that it may be easy to support the hard electrode holder 10.

[0034] Moreover, the body section 12 is equipped with the plate-like parts 121a and 121b which contact both sides of the letter housing 42 of elasticity resin bag manufacture of the leukopheresis machine 40 at the time of use like the body section 2 of the hard electrode holder 1 of the example mentioned above, which were formed almost in parallel and which face each other, and spacing of the plate-like parts 121a and 121b which the body section 2 faces has become more than the thickness of the leukopheresis machine 40. Moreover, spacing of the plate-like parts 121a and 121b which the body section 12 faces is thinner than the thickness of the leukopheresis machine at the time of dipping the filtered matter in a leukopheresis machine like the body section 2, without equipping with a hard electrode holder. In addition, the filtration velocity of the leukopheresis machine 40 can be adjusted by adjusting spacing of the plate-like parts 121a and 121b which the hard electrode holder 10 faces. In addition, the interior of the body section 12 cannot press a leukopheresis machine from the exterior at the time of use, and as long as spacing of the plate-like part which a hard electrode holder faces regulates the capacity of an inflow side blood room moderately above the thickness of a leukopheresis machine, it may be produced by what kind of configuration and magnitude. As for the magnitude inside the body section 12 of the hard electrode holder 10, it is desirable that the lay length to which the longitudinal direction of the increase of 0 - 3mm and drawing 2 and the die length of the longitudinal direction of the increase of 0 - 3mm and drawing 2 cross [spacing of the plate-like parts 121a and 121b which face each other] at right angles to the die length of a leukopheresis machine to the thickness of a leukopheresis machine is the increase of 0 - 3mm to the width of face of a leukopheresis machine.

[0035] The opening 13 for insertion is a part which inserts the leukopheresis machine 40 in the body section 12, and is formed in the side edge of the plate-like parts 121a and 121b which face each other. Moreover, since opening 13 is produced by the magnitude more than the cross section of the B-B line cross section (drawing 9) of the leukopheresis machine 40 of drawing 6 , it can insert the leukopheresis machine 40 in the hard electrode holder 10 from the side-face side. In addition, you may produce so that the diameter of near opening of the opening 13 for insertion may be expanded in the shape of a taper toward an opening edge like the hard electrode holder 1.

[0036] The upper limit side penetration section 14 is a part which it is prepared in the upper limit of the body section 12, and it is the part which the blood inflow port 46 of the leukopheresis machine 40 penetrates, the lower limit side penetration section 15 is formed in the lower limit of the body section 12, and the blood outflow port 47 of the leukopheresis machine 40 penetrates. For this reason, the leukopheresis machine 40 can be filtered also in the condition of having equipped the leukopheresis machine 40 with the hard electrode holder 10. Moreover, although the lower limit side penetration section 15 is formed in the location corresponding to the blood inflow port 46 of the body section 12 in the example in the location corresponding to the blood outflow port 47 of the body section 12 in the upper limit side penetration section 14 if the liquid flow which passes the tubes 416 and 417 connected to the blood inflow port 46 and the blood outflow port 47 lies in the blood inflow port 46 and the blood outflow port 47 is not barred. Respectively, it may be produced by what kind of location by the side of the upper limit of the body section 12, and the lower limit of the body section 12 of blood (blood inflow port 46 side) (blood outflow port 47 side). Moreover, although the upper limit side penetration section 14 and the lower limit side penetration section 15 are produced in the example by the same round shape as the outer diameter of a port 46 and a port 47, they may be produced to elliptical etc. In addition, as for the magnitude of the bore of the penetration sections 14 and 15, it is desirable that they are -1mm or more and less than +10mm to the outer diameter of a port like the hard electrode holder 1. Moreover, in the example, although it is that to which a port 46 penetrates the upper limit side penetration section 14, and a port 47 penetrates the lower limit side penetration section 17 where the leukopheresis machine 40 is equipped with a hard electrode

holder, it may not be restricted to this, but a tube 416 may penetrate the upper limit side penetration section 14, and a tube 417 may penetrate the lower limit side penetration section 15. As for the bore of the penetration section in this case, it is desirable that it is what is produced by the magnitude of -1mm or more and less than +10mm to the outer diameter of a tube.

[0037] The notching section 16 for upper limit side induction is a part which guides the blood inflow port 46 or a tube 416 from the opening 13 to the upper limit side penetration section 14 in the example, and the lower limit side induction notching section 17 serves as a part which guides the blood outflow port 47 or a tube 417 from the opening 13 to the lower limit side penetration section 15. In addition, a tube may be made hard to separate from a hard electrode holder by not being restricted to this but carrying out ups and downs etc. on the way, although the notching sections 16 and 17 are produced in a straight line in the example from the upper limit side penetration section 14 and the lower limit side penetration section 15 to the opening 13 for insertion, respectively. As for the width of face of the notching sections 16 and 17, it is desirable to be produced within -1mm or more and +10mm to the outer diameter of a port or a tube like the case of the upper limit side penetration section 14 and the lower limit side penetration section 15.

[0038] In addition, the bore of the penetration section is larger than the outer diameter of a port, and it is more desirable that the width of face of notching is produced more narrowly than the outer diameter of a tube. Thus, by producing, while being hard coming to separate a port from a hard electrode holder, the liquid flow which passes the tube connected to the port and the port is not barred. Moreover, as for the thickness of the hard electrode holder 10, it is desirable that almost all parts are 2mm or more like the case of the hard electrode holder 1. As a formation ingredient of a hard electrode holder, the same thing as the hard electrode holder 1 is used. In addition, the thickness of the hard electrode holder 10 has 2-3 more desirablemm in the range of 2mm or more. Moreover, as for the hard electrode holder 10, it is desirable to equip the inside with two or more letter objects of a projection (not shown) like the hard electrode holder 1. Furthermore, as for the hard electrode holder 10, it is desirable to have two or more ribs (not shown) as well as the hard electrode holder 1. In addition, as for the configuration and magnitude of the letter object of a projection, or a rib, it is desirable that it is the same as that of the hard electrode holder 1. Moreover, as for the hard electrode holder 10, it is desirable to be produced with resin with high transparency like the hard electrode holder 1. As resin with high transparency, the same thing as a hard electrode holder is desirable. In addition, as long as it can check the condition in a leukopheresis machine, it may be produced with resin that it does not need to be completely transparent and translucent.

[0039] Next, the manufacture approach of the hard electrode holder 10 of the example of this invention is explained. First, injection molding of the background member 12b containing side front member 12a and plate-like partial 121b containing plate-like partial 121a is carried out separately. Next, the hard electrode holder 10 is produced by arranging so that the side which contains the side and the leukopheresis machine 40 of background member 12b which contain the leukopheresis machine 40 of side front member 12a may be turned inside and both may counter, and joining a mutual periphery. Junction is performed by the same approach as the hard electrode holder 1.

[0040] Next, the operation of the hard electrode holder 10 which are other examples of this invention is explained. First, the side-face side of the leukopheresis machine 40 is inserted from the opening 13 for insertion formed in the side face of the hard electrode holder 10, and the leukopheresis machine 40 whole is contained in the hard electrode holder 10. In this case, the blood inflow port 46 passes the notching section 16 from the opening 13 for insertion, and is guided to the upper limit side penetration section 14, and similarly, the blood outflow port 47 passes the notching section 17 from the opening 13 for insertion, and is guided to the lower limit side penetration section 15. What is necessary is just to perform the procedure of the wearing approach conversely, when removing the hard electrode holder 10 from the leukopheresis machine 40. As mentioned above, it has removed after filtration from the leukopheresis machine 40 easily while being able to equip the leukopheresis machine 40 with the hard electrode holder 10 easily before filtration.

[0041] Next, the leukopheresis dexteros hard electrode holder which are other examples of this invention is explained. The perspective view of the leukopheresis machine contained by the leukopheresis dexteros hard electrode holder which showed the perspective view showing the leukopheresis dexteros hard electrode holder whose drawing 3 is other examples of this invention, and drawing 15 to drawing 3, and drawing 16 are the central sectional views of the leukopheresis machine shown in drawing 15. The leukopheresis dexteros hard electrode holder 20 of this example The letter housing 72 of elasticity resin bag manufacture, and the filter member 75 for leukopheresis prepared so that the inside of housing 72 might be classified into the inflow side blood room 73 and the outflow side blood room 74, It is prepared in the inflow side blood room 73, open for free passage blood inflow port 76, and other end side of housing 72, and is for equipping the leukopheresis machine 70 equipped with the outflow side blood room 74 and the blood outflow port 77 open for free passage. And the hard electrode holder 20 is equipped with the body section 22 for containing saccate housing 72 part of the leukopheresis machine 70, the body section 22 is equipped with the plate-like parts 221a and 221b which contact a leukopheresis machine at the time of use, which were formed almost in parallel and which face each other, and spacing of the plate-like parts 221a and 221b which the body section 22 faces has become more than the thickness of the leukopheresis machine 70. Moreover, the opening 23 for leukopheresis machine insertion located in the side edge of the plate-like parts 221a and 221b which the hard electrode holder 20 faces, The bottom penetration section 24 which can penetrate the tube 716 which is prepared near the center section of upper plate-like partial 221a, and is connected to the blood inflow port 76 or the blood inflow port 76 of the leukopheresis machine 70, The bottom penetration section 25 which can penetrate the tube 717 which is prepared near the center section of lower plate-like partial 221b, and is connected to the blood outflow port 77 or the blood outflow port 77 of the leukopheresis machine 70, The notching section 26 for bottom induction for induction of the tube 716 connected to the blood inflow port 76 or the blood inflow port 76 which extends from the bottom penetration section 24 to opening 23, It has the notching section 27 for bottom induction for induction of the tube 717 connected to the blood outflow port 77 or the blood outflow port 77 which extends from the bottom penetration section 25 to opening 23.

[0042] Except for the blood inflow port 76 being formed near the center section of the housing 72 by the side of a blood inflow, and the blood outflow port 77 being formed near the central part of the housing 72 by the side of a blood outflow, and the outer diameter being produced disc-like, since it is almost the same as the basic structure of the leukopheresis machine 40, the basic structure of the leukopheresis machine 70 is explained focusing on difference below. The leukopheresis machine 70 so that end opening of the elasticity resin tube which constitutes the blood inflow port 76 may carry out opening into the inflow side blood room 73 The hole of the almost same magnitude is produced with the outer diameter of the end of a tube near the center section of the thermoplastic elasticity resin sheet 721 which constitutes the inflow side blood room 73. The end of an elasticity resin tube is inserted in it so that the field of the filter member 75 for leukopheresis and an elasticity resin tube may cross at right angles mostly, and it is produced by carrying out thermal melting arrival of a tube and the thermoplastic elasticity resin sheet 721. The hole of the almost same magnitude is produced with the outer diameter of the end of a tube near the center section of the thermoplastic elasticity resin sheet 722 which constitutes the outflow side blood room 74 so that similarly end opening of the elasticity resin tube which constitutes the blood outflow port 77 may carry out opening into the outflow side blood room 74. The end of a tube is inserted in it so that it may intersect perpendicularly with the field of the filter member 75 for leukopheresis mostly, and it is produced by carrying out thermal melting arrival of a tube and the thermoplastics sheet 722. In addition, thermal melting arrival is performed by the approach mentioned above.

[0043] The hard electrode holder 20 of the example of this invention is equipped with the body section 22, the opening 23 for leukopheresis machine insertion, the bottom penetration section 24 and the bottom penetration section 25, and the notching section 26 for bottom induction and the notching section 27 for bottom induction as shown in drawing 3. It is a part for the body section 22 to contain saccate housing 72 part of the leukopheresis machine 70 Inside, and die

length, width of face, and thickness are formed more greatly than saccate housing 72 part. For this reason, the hard electrode holder 20 can contain the leukopheresis machine 70 at the time of hard electrode-holder 20 wearing, without pressing the saccate housing 72 while being able to contain the whole housing 72 part. Moreover, since the thickness inside the hard electrode holder 20 is produced by the almost same configuration as the thickness of the saccate housing 72, the leukopheresis machine 70 hardly moves within the hard electrode holder 20 after wearing.

[0044] Moreover, the body section 22 is equipped with the plate-like parts 221a and 221b which contact both sides of the letter housing 72 of elasticity resin bag manufacture of the leukopheresis machine 70 like the body section 2 at the time of use, which were formed almost in parallel and which face each other, and spacing of the plate-like parts 221a and 221b which the body section 22 faces has become more than the thickness of the leukopheresis machine 70. Moreover, spacing of the plate-like parts 221a and 221b which the body section 22 faces is thinner than the thickness of the leukopheresis machine at the time of dipping the filtered matter in a leukopheresis machine like the body section 2, without equipping with a hard electrode holder. In addition, the filtration velocity of the leukopheresis machine 70 can be adjusted by adjusting spacing of the plate-like parts 221a and 221b which the hard electrode holder 20 faces. In addition, the interior of the body section 22 cannot press a leukopheresis machine from the exterior at the time of use, and as long as spacing of the plate-like part which a hard electrode holder faces regulates the capacity of an inflow side blood room moderately above the thickness of a leukopheresis machine, it may be produced by what kind of configuration and magnitude. As for the magnitude inside the body section 22 of the hard electrode holder 20, it is desirable that the lay length to which the longitudinal direction of the increase of 0 - 3mm and drawing 3 and the die length of the longitudinal direction of the increase of 0 - 3mm and drawing 3 cross [spacing of the plate-like parts 221a and 221b which face each other] at right angles to the diameter of a leukopheresis machine to the thickness of a leukopheresis machine is the increase of 0 - 3mm to the diameter of a leukopheresis machine.

[0045] The opening 23 for leukopheresis machine insertion is a part which inserts the leukopheresis machine 70 in the body section 22, and is formed in the side edge of the plate-like parts 221a and 221b which face each other. Moreover, opening 23 is produced by the magnitude more than the cross section of the central sectional view (drawing 16) of the leukopheresis machine 70 of drawing 15. Therefore, the leukopheresis machine 70 can be inserted in the hard electrode holder 20 from the side-face side. In addition, you may produce so that the diameter of near opening of the opening 23 for insertion may be expanded in the shape of a taper toward an opening edge like the hard electrode holder 1.

[0046] In the example, the bottom penetration section 24 is formed in the location corresponding to the blood inflow port 76 of the center section of plate-like partial 221a of the body section 22 top, and where the leukopheresis machine 70 is inserted in the hard electrode holder 20, it serves as a part which can penetrate the blood inflow port 76. On the other hand, the bottom penetration section 25 is formed in the location corresponding to the blood outflow port of the center section of plate-like partial 221b of the body section 22 bottom, and where the leukopheresis machine 70 is contained in a hard electrode holder, it serves as a part which can penetrate the blood outflow port 77. In addition, the location in which the bottom penetration section 24 and the bottom penetration section 25 are formed if the liquid flow which passes the tubes 716 and 717 which were not restricted to what was mentioned above but were connected to the blood inflow port 76 and the blood outflow port 77 list in the blood inflow port 76 and the blood outflow port 77 is not barred. Respectively, it may be produced by what kind of location of plate-like partial 221a (blood inflow port 76 side) of the body section 22 top, and plate-like partial 221b (blood outflow port 77 side) of the body section 22 bottom of blood. Moreover, although the bottom penetration section 24 and the bottom penetration section 25 are produced in the example by the same round shape as the outer diameter of a port 76 and a port 77, they may be produced by elliptical etc. Moreover, as for the magnitude of bottom penetration section 24 and bottom penetration section 25 bore, it is desirable that they are -1mm or more and less than +10mm to the outer diameter of a port like the hard electrode holder 10. In addition, in the

example, although it is that to which a port 76 penetrates the bottom penetration section 24, and a port 77 penetrates the bottom penetration section 25 where the leukopheresis machine 70 is equipped with a hard electrode holder, it may not be restricted to this, but a tube 716 may penetrate the bottom penetration section 24, and a tube 717 may penetrate the bottom penetration section 25. As for the bore of the penetration section in this case, it is desirable that it is what is produced by the magnitude of -1mm or more and less than $+10\text{mm}$ to the outer diameter of a tube.

[0047] Moreover, the hard electrode holder 20 is equipped with the notching section 26 for bottom induction for induction of the blood inflow port 76 which extends from the bottom penetration section 24 to opening 23, and the notching section 27 for bottom induction for induction of the blood outflow port 77 which extends from the bottom penetration section 25 to opening 23. Moreover, a tube may be made hard to separate from a hard electrode holder by not being restricted to this but carrying out ups and downs etc. on the way, although the notching sections 26 and 27 are produced in a straight line in the example from the bottom penetration section 24 and the bottom penetration section 25 to the opening 23 for insertion, respectively. Moreover, as for the width of face of the notching sections 26 and 27, it is desirable to be produced within -1mm or more and $+10\text{mm}$ to the outer diameter of a port or a tube like the case of the bottom penetration section 24 and the bottom penetration section 25.

[0048] In addition, the bore of the penetration section is larger than the outer diameter of a port, and it is desirable that the width of face of the notching section is produced more narrowly than the outer diameter of a tube. Thus, by producing, while being hard coming to separate a port from a hard electrode holder, the liquid flow which passes the tube connected to the port and the port is not barred. Moreover, as for the thickness of the hard electrode holder 20, it is desirable that almost all parts are 2mm or more like the case of the hard electrode holder 1. As a formation ingredient of a hard electrode holder, the same thing as the hard electrode holder 1 is used. In addition, the thickness of the hard electrode holder 20 has $2-3$ more desirableness in the range of 2mm or more.

[0049] Moreover, the hard electrode holder 20 is the letter object of a projection of plurality [inside / the] (not shown) as well as the hard electrode holder 1. Moreover, as for the hard electrode holder 20, it is desirable to have two or more ribs (not shown) as well as the hard electrode holder 1. In addition, as for the configuration and magnitude of the letter object of a projection, or a rib, it is desirable that it is the same as that of the hard electrode holder 1. Moreover, as for the hard electrode holder 20, it is desirable to be produced with resin with high transparency like the hard electrode holder 1. As resin with high transparency, the same thing as the hard electrode holder 1 is desirable. In addition, as long as it can check the condition in a leukopheresis machine, it may be produced with resin that it does not need to be completely transparent and translucent.

[0050] Next, the manufacture approach of the hard electrode holder 20 of the example of this invention is explained. First, the hard electrode holder 20 carries out injection molding of side front member 22a containing upper plate-like partial 221a, and the background member 22b containing lower plate-like partial 221b separately. Next, it arranges so that the side which contains the side and the leukopheresis machine of background member 22b which contain the leukopheresis machine of side front member 22a may be turned inside and both may counter, and it is produced by joining a mutual periphery. Junction is performed by the approach mentioned above.

[0051] Next, the operation of the hard electrode holder 20 which are other examples of this invention is explained. First, the leukopheresis machine 70 is inserted from the opening 23 for insertion formed in the side face of the hard electrode holder 20 from the side-face side, and the leukopheresis machine 70 whole is contained. Under the present circumstances, the blood inflow port 76 passes the notching section 26 from the opening 23 for insertion, and is guided to the bottom penetration section 24. Similarly, the blood outflow port 77 passes the notching section 27 from the opening 23 for insertion, and is guided to the bottom penetration section 25. What is necessary is just to perform a procedure contrary to the procedure of the wearing approach, when removing the hard electrode holder 20 from the leukopheresis machine 70. As mentioned

above, the leukopheresis machine 70 can be easily equipped with the hard electrode holder 20 before filtration, and it can remove after filtration from the leukopheresis machine 70 easily.

[0052] Next, the leukopheresis dexterous hard electrode holder 30 which are other examples of this invention is explained. Drawing 4 is the perspective view of the leukopheresis dexterous hard electrode holder 30 which are other examples of this invention. The leukopheresis dexterous hard electrode holder 30 of this example It has the body section 32 for containing saccate housing 42 part of the leukopheresis machine 40. The body section 32 Having the plate-like parts 321a and 321b in contact with both sides of the letter housing 42 of elasticity resin bag manufacture of the leukopheresis machine 40 which were formed almost in parallel and which face each other at the time of use, spacing of the plate-like parts 321a and 321b which the body section 22 faces has become more than the thickness of the leukopheresis machine 40.

Moreover, while the body section 32 is supported to revolve by 1st monotonous section 32a and 1st monotonous section 32a possible [closing motion] It has 2nd monotonous section 32b which becomes almost parallel to 1st monotonous section 32a in the state of obstruction which contains the leukopheresis machine 40. Further the body section 32 In the state of leukopheresis machine 40 receipt The lower limit side penetration section 36 which can penetrate the tube 417 connected to the blood outflow port 47 or the blood outflow port 47 of the upper limit side penetration section 35 which can penetrate the tube 416 connected to the blood inflow port 46 or the blood inflow port 46 of the leukopheresis machine 40, and the leukopheresis machine 40 It has.

[0053] The leukopheresis machine 40 is used for the leukopheresis machine of this invention. The hard electrode holder 30 of this invention is equipped with the body section 32, and the upper limit side penetration section 35 and the lower limit side penetration section 36. The body section 32 is equipped with 2nd monotonous section 32b containing 1st monotonous section 32a and plate-like partial 321b containing plate-like partial 321a as shown in drawing 4 , and it is produced so that 1st monotonous section 32a and 2nd monotonous section 32b may become the almost same configuration. Moreover, when crevice 33a produced by the 1st upper limit and lower limit of a side edge of monotonous section 32a and heights 33b produced in those insides by the 2nd upper limit and lower limit of a side edge of monotonous section 32b fit in, 1st monotonous section 32a and 2nd monotonous section 32b are supported to revolve, and it has become what both can open and close. In addition, the structure of the body section 32 is not restricted to what was mentioned above. For example, the body section may be produced in one so that the thickness of the side edge of the body section may become thin, and closing motion of the 1st monotonous section and the 2nd monotonous section may be enabled.

[0054] Moreover, where 1st monotonous section 32a and 2nd monotonous section 32b are closed (state of obstruction), plate-like partial 321a and plate-like partial 321b become parallel, and the tooth space which contains the leukopheresis machine 40 is formed in the interior of the body section 32. As for the inside dimension of the body section in a state of obstruction, it is desirable that it is the magnitude of extent which contains the leukopheresis machine 40 exactly. Moreover, the body section 32 is equipped with the plate-like parts 321a and 321b which contact both sides of the letter housing 42 of elasticity resin bag manufacture of the leukopheresis machine 40 like the body section 2 at the time of use (state of obstruction), which were formed almost in parallel and which face each other, and spacing of the plate-like parts 321a and 321b which the body section 32 faces has become more than the thickness of the leukopheresis machine 40. Moreover, spacing of the plate-like parts 321a and 321b which the body section 32 faces is thinner than the thickness of the leukopheresis machine at the time of dipping the filtered matter in a leukopheresis machine like the body section 2, without equipping with a hard electrode holder.

[0055] In addition, the filtration velocity of the leukopheresis machine 40 can be adjusted by adjusting spacing of the plate-like parts 321a and 321b which the hard electrode holder 30 faces. In addition, the interior of the body section 32 cannot press a leukopheresis machine from the exterior at the time of use, and as long as spacing of the plate-like part which a hard electrode holder faces regulates the capacity of an inflow side blood room moderately above the thickness of a leukopheresis machine, it may be produce by what kind of configuration and magnitude. As

for the magnitude inside the body section 32 of the hard electrode holder 30, it is desirable that the lay length to which the longitudinal direction of the increase of 0 - 3mm and drawing 4 and the die length of the longitudinal direction of the increase of 0 - 3mm and drawing 4 cross [spacing of the plate-like parts 321a and 321b which face each other] at right angles to the die length of a leukopheresis machine to the thickness of a leukopheresis machine is the increase of 0 - 3mm to the width of face of a leukopheresis machine. Moreover, the body section 32 equips the upper limit side penetration section 35 and the lower limit which can penetrate the blood inflow port 46 of the leukopheresis machine 40 to upper limit with the lower limit side penetration section 36 which can penetrate the blood outflow port 47 of the leukopheresis machine 40 in the state of leukopheresis machine 40 receipt. Thereby, even if it is in the condition which equipped the leukopheresis machine 40 with the hard electrode holder 30, it can filter with the leukopheresis vessel 40.

[0056] The semicircle formed in 1st monotonous section 32a and the semicircle formed in 2nd monotonous section 32b lap, and the upper limit side penetration section 35 is formed as one circle of things. Similarly, the lower limit side penetration section 36 is also formed. In addition, in the example, although the upper limit penetration section 35 and the lower limit side penetration section 36 are produced circularly, they may be produced by the ellipse form etc. In addition, although the upper limit side penetration section 35 is formed in the location corresponding to the blood inflow port 46 of the body section 32 and 38 from lower limit side penetration is prepared in the location corresponding to the blood outflow port 47 by the side of a lower limit in the example If the liquid flow which passes the tube 417 connected to the tube 418 list which was not restricted to these but was connected to the blood inflow port 46 or the blood inflow port 46 in the blood outflow port 47 or the blood outflow port 47 is not barred Respectively, it may be produced by what kind of location by the side of the upper limit of the body section 32, and the lower limit of the body section 32 (blood inflow port 46 side) (blood outflow port 47 side). Moreover, as for the magnitude of the bore of the upper limit side penetration section 35 and the lower limit side penetration section 36, it is desirable that they are -1mm or more and less than +10mm to the outer diameter of a port like the hard electrode holder 20. In addition, in the example, although it is that to which a port 46 penetrates the upper limit side penetration section 35, and a port 47 penetrates the lower limit side penetration section 36 where the leukopheresis machine 40 is equipped with a hard electrode holder, it may not be restricted to this, but a tube 416 may penetrate the upper limit side penetration section 35, and a tube 417 may penetrate the lower limit side penetration section 36. As for the bore of the penetration section in this case, it is desirable that it is what is produced by the magnitude of -1mm or more and less than +10mm to the outer diameter of a tube.

[0057] Moreover, the body section 32 is fixed by the state of obstruction, when the part which 1st monotonous section 32a supports to revolve, crevice 34a for immobilization prepared in the side edge of the opposite side, the part which 2nd monotonous section 32b supports to revolve, and heights 34b for immobilization prepared in the side edge of the opposite side fit in. By such configuration, after use can remove the 2nd monotonous section from the 1st monotonous section easily. In addition, the attachment-and-detachment approach of the 1st monotonous section of the body section 32 and the 2nd plate is not restricted to what was mentioned above.

[0058] Moreover, as for the thickness of the hard electrode holder 30, it is desirable that almost all parts are 2mm or more like the case of the hard electrode holder 1. As a formation ingredient of a hard electrode holder, the same thing as the hard electrode holder 1 is used. In addition, the thickness of the hard electrode holder 30 has 2-3 more desirablemm in the range of 2mm or more. Moreover, the hard electrode holder 30 is the letter object of a projection of plurality [inside / the] (not shown) as well as the hard electrode holder 1. Moreover, as for the hard electrode holder 30, it is desirable to have two or more ribs (not shown) as well as the hard electrode holder 1. In addition, as for the configuration and magnitude of the letter object of a projection, or a rib, it is desirable that it is the same as that of the hard electrode holder 1. Moreover, as for the hard electrode holder 30, it is desirable to be produced with resin with high transparency like the hard electrode holder 1. As resin with high transparency, what was mentioned above is desirable. In addition, as long as it can check the condition in a leukopheresis

machine, it may be produced with resin that it does not need to be completely transparent and translucent.

[0059] Next, the manufacture approach of the hard electrode holder 30 is explained. First, injection molding of 1st monotonous section 32a containing plate-like partial 321a of the hard electrode holder 30 and the 2nd monotonous section 32b containing plate-like partial 321b is carried out separately. Next, it arranges so that the side which contains the side and the leukopheresis machine 40 of 2nd monotonous section 32b which contain the leukopheresis machine 40 of 1st monotonous section 32a may be turned inside and both may counter, and fitting of crevice 33a formed in 1st monotonous section 32a and the heights 33b formed in 2nd monotonous section 32b is carried out, and the hard electrode holder 30 is produced.

[0060] Next, the operation of the hard electrode holder 30 of other examples of this invention is explained using drawing 4. First, the body section 32 is opened and the leukopheresis machine 40 is arranged to 1st monotonous section 32a or 2nd monotonous section 32b. At this time, the blood inflow port 46 is arranged at the part which constitutes the upper limit side penetration section 35, and the blood outflow port 47 is arranged at the part which constitutes the lower limit side penetration section 38. Next, 1st monotonous section 32a and 2nd monotonous section 32b are closed, fitting of crevice 34a for immobilization and the heights 34b for immobilization is carried out, and the leukopheresis machine 40 is equipped with the hard electrode holder 30. What is necessary is just to perform a procedure contrary to the procedure of the wearing approach, when removing the hard electrode holder 30 from the leukopheresis machine 40. As mentioned above, it has removed after filtration from the leukopheresis machine 40 easily while being able to equip the leukopheresis machine 40 with the hard electrode holder 30 easily before filtration.

[0061] Next, the leukopheresis dexterous hard electrode holder which are other examples of this invention is explained. Drawing 5 is the perspective view of the leukopheresis dexterous hard electrode holder which are other examples of this invention. The leukopheresis dexterous hard electrode holder 80 of this example It has the body section 82 for containing saccate housing 42 part of the leukopheresis machine 40. The body section 82 Having the plate-like parts 821a and 821b in contact with both sides of the letter housing 42 of elasticity resin bag manufacture of the leukopheresis machine 40 which were formed almost in parallel and which face each other at the time of use, spacing of the plate-like parts 821a and 821b which the body section 82 faces has become more than the thickness of the leukopheresis machine 40. Moreover, while the body section 82 is removable to 1st monotonous section 82a and 1st monotonous section 82a It has 2nd monotonous section 82b which becomes almost parallel to 1st monotonous section 82a in the state of wearing which contains the leukopheresis machine 40. Further the body section 82 In the state of leukopheresis machine 40 receipt The lower limit side penetration section 86 which can penetrate the tube 417 connected to the blood outflow port 47 or the blood outflow port 47 of the upper limit side penetration section 85 which can penetrate the tube 416 connected to the blood inflow port 46 or the blood inflow port 46 of the leukopheresis machine 40, and the leukopheresis machine 40 It has.

[0062] The hard electrode holder 80 of this invention is equipped with the body section 82, and the upper limit side penetration section 85 and the lower limit side penetration section 86. The body section 82 is equipped with 2nd monotonous section 82b containing 1st monotonous section 82a and plate-like partial 821b which contain plate-like partial 821a as shown in drawing 5. 1st monotonous section 82a and 2nd monotonous section 82b are produced by another member, and both are produced by the almost same configuration. Moreover, the body section 82 has fixed parts 84a and 84b at the both-sides edge so that 1st monotonous section 82a and 2nd monotonous section 82b may be removable. Fixed part 84a is produced by the both-sides edge of 1st monotonous section 82a as a crevice, and fixed part 84b is produced as heights by the location corresponding to fixed part 84a of 2nd monotonous section 82b. And 1st monotonous section 82a and 2nd monotonous section 82b are mutually fixed by fitting in fixed part 84b which is fixed part 84a and heights which are crevices. Moreover, after use can remove 2nd monotonous section 82b from 1st monotonous section 82a easily from such a configuration. In addition, the approach of fixing 2nd monotonous section 82b to 1st monotonous section 82a is

not restricted to what was mentioned above. For example, the 1st monotonous section and the 2nd monotonous section may be fixed using another member.
[0063] Moreover, where 1st monotonous section 82a and 2nd monotonous section 82b are closed (state of obstruction), plate-like partial 821a and plate-like partial 821b become parallel, and the tooth space which contains the leukopheresis machine 40 is formed in the interior of the body section 82. In the example, the inside dimension of the body section in a state of obstruction is produced by the magnitude of extent which contains the leukopheresis machine 40 exactly. Moreover, the body section 82 is equipped with the plate-like parts 821a and 821b which contact both sides of the letter housing 42 of elasticity resin bag manufacture of the leukopheresis machine 40 like the body section 2 at the time of use (state of obstruction), which were formed almost in parallel and which face each other, and spacing of the plate-like parts 821a and 821b which the body section 82 faces has become more than the thickness of the leukopheresis machine 40. Moreover, spacing of the plate-like parts 821a and 821b which the body section 82 faces is thinner than the thickness of the leukopheresis machine at the time of dipping the filtered matter in a leukopheresis machine like the body section 2, without equipping with a hard electrode holder.

[0064] In addition, the filtration velocity of the leukopheresis machine 40 may be adjusted by adjusting spacing of the plate-like parts 821a and 821b which the hard electrode holder 80 faces. In addition, the interior of the body section 82 cannot press a leukopheresis machine from the exterior at the time of use, and as long as spacing of the plate-like part which a hard electrode holder faces regulates the capacity of an inflow side blood room moderately above the thickness of a leukopheresis machine, it may be produced by what kind of configuration and magnitude. As for the magnitude inside the body section 82 of the hard electrode holder 80, it is desirable that the lay length to which the longitudinal direction of the increase of 0 - 3mm and drawing 5 cross the die length of the longitudinal direction of the increase of 0 - 3mm and drawing 5 cross [spacing of the plate-like parts 821a and 821b which face each other] at right angles to the die length of a leukopheresis machine to the thickness of a leukopheresis machine is the increase of 0 - 3mm to the width of face of a leukopheresis machine. Moreover, the body section 82 equips the upper limit side penetration section 85 and the lower limit which can penetrate the blood inflow port 46 of the leukopheresis machine 40 to upper limit with the lower limit side penetration section 86 which can penetrate the blood outflow port 47 of the leukopheresis machine 40 in the state of leukopheresis machine 40 receipt. Thereby, even if it is in the condition which equipped the leukopheresis machine 40 with the hard electrode holder 80, it can filter with the leukopheresis vessel 40.

[0065] The upper limit side penetration section 85 is formed as one circle, when the semicircle formed in 1st monotonous section 82a and the semicircle formed in 2nd monotonous section 82b lap. Similarly, the lower limit side penetration section 86 is also formed. In addition, in the example, although the upper limit penetration section 85 and the lower limit side penetration section 86 are produced circularly, they may be produced by the ellipse form etc. Where the leukopheresis machine 40 is equipped with the hard electrode holder 80, the blood inflow port 46 of the leukopheresis machine 40 passes the upper limit side penetration section 85, and the blood outflow port 47 of the leukopheresis machine 40 passes the lower limit side penetration section 86. For this reason, also in the condition of having equipped the leukopheresis machine 40 with the hard electrode holder 80, it can filter with the leukopheresis vessel 40. In addition, although the upper limit side penetration section 85 is formed in the location corresponding to the blood inflow port 46 of the body section 82 and the lower limit side penetration section 86 is formed in the location corresponding to the blood outflow port 47 by the side of a lower limit in the example if the liquid flow which passes the tube 417 connected to the tube 416 list which was not restricted to these but was connected to the blood inflow port 46 or the blood inflow port 46 in the blood outflow port 47 or the blood outflow port 47 is not barred respectively, it may be produced by what kind of location by the side of the upper limit of the body section 82; and the lower limit of the body section 82 (blood inflow port 46 side) (blood outflow port 47 side). Moreover, as for the magnitude of the bore of the upper limit side penetration section 85 and the lower limit side penetration section 86, it is desirable that they are -1mm or more and less than

+10mm to the outer diameter of a port like the hard electrode holder 20. In addition, in the example, although it is that to which a port 46 penetrates the upper limit side penetration section 85, and a port 47 penetrates the lower limit side penetration section 86 where the leukopheresis machine 40 is equipped with the hard electrode holder 80, it may not be restricted to this, but a tube 416 may penetrate the upper limit side penetration section 85, and a tube 417 may penetrate the lower limit side penetration section 86. As for the bore of the penetration section in this case, it is desirable that it is what is produced by the magnitude of -1mm or more and less than +10mm to the outer diameter of a tube.

[0066] Moreover, as for the thickness of the hard electrode holder 80, it is desirable that almost all parts are 2mm or more like the case of the hard electrode holder 1. As a formation ingredient of a hard electrode holder, the same thing as the hard electrode holder 1 is used. In addition, the thickness of the hard electrode holder 80 has 2-3 more desirablenmm in the range of 2mm or more. Moreover, the hard electrode holder 80 is the letter object of a projection of plurality [inside / the] (not shown) as well as the hard electrode holder 1. Moreover, as for the hard electrode holder 80, it is desirable to have two or more ribs (not shown) as well as the hard electrode holder 1. In addition, as for the configuration and magnitude of the letter object of a projection, or a rib, it is desirable that it is the same as that of the hard electrode holder 1. Moreover, as for the hard electrode holder 80, it is desirable to be produced with resin with high transparency like the hard electrode holder 1. As resin with high transparency, the same thing as the hard electrode holder 1 is desirable. In addition, as long as it can check the condition in a leukopheresis machine, it may be produced with resin that it does not need to be completely transparent and translucent.

[0067] Next, the manufacture approach of the hard electrode holder 80 is explained. First, injection molding of 1st monotonous section 82a containing plate-like partial 821a and the 2nd monotonous section 82b containing plate-like partial 821b is carried out separately. Next, it arranges so that the side which contains the side and the leukopheresis machine 40 of 2nd monotonous section 82b which contain the leukopheresis machine 40 of 1st monotonous section 82a may be turned inside and both may counter, and fitting of crevice 84a formed in 1st monotonous section 82a and the heights 84b formed in 2nd monotonous section 82b is carried out, and the hard electrode holder 80 is produced.

[0068] Next, the operation of the hard electrode holder 80 of other examples of this invention is explained using drawing 5. First, the body section 82 is opened and the leukopheresis machine 40 is arranged to 2nd monotonous section 82b. At this time, the blood inflow port 46 is arranged at the part which constitutes the upper limit side penetration section 85 of 2nd monotonous section 82b, and the blood outflow port 47 is arranged at the part which constitutes the lower limit side penetration section 86 of 2nd monotonous section 82b. Next, 1st monotonous section 82a is closed in the 2nd monotonous section, fitting of fixed part 84a and the fixed part 84b is carried out, and the leukopheresis machine 40 is equipped with the hard electrode holder 80. What is necessary is just to perform a procedure contrary to the procedure of the wearing approach, when removing the hard electrode holder 80 from the leukopheresis machine 40. As mentioned above, it has removed after filtration from the leukopheresis machine 40 easily while being able to equip the leukopheresis machine 40 with the hard electrode holder 80 easily before filtration. As mentioned above, although the leukopheresis dexterous hard electrode holder and the leukopheresis machine have been explained, these configurations are not limited to what was mentioned above.

[0069]

[Effect of the Invention] The leukopheresis dexterous hard electrode holder of this invention Letter housing of elasticity resin bag manufacture. The filter member for leukopheresis prepared so that the inside of this housing might be classified into an inflow side blood room and an outflow side blood room. It is a leukopheresis dexterous hard electrode holder for equipping a leukopheresis machine equipped with said inflow side blood room, the blood inflow port open for free passage, and said outflow side blood room and a blood outflow port open for free passage. This hard electrode holder is equipped with the body section for containing said leukopheresis machine, this body section is equipped with the plate-like part which contacts a leukopheresis

machine at the time of use, which was formed almost in parallel and which faces each other, and spacing of the plate-like part which this body section faces has become more than the thickness of said leukopheresis machine. For this reason, the leukopheresis machine which has housing made of elasticity resin is equipped with a hard electrode holder, and it is enabling suitable filtration of a leukopheresis machine.

[0070] Moreover, opening for leukopheresis machine insertion by which the leukopheresis dexterous hard electrode holder of this invention was prepared in the end, The penetration section which can penetrate the tube which is prepared in an other end side and connected to said port or this port of said leukopheresis machine, If it has the notching section for induction for induction of the tube connected to said port or this port which extends from this penetration section to said opening, the leukopheresis machine which has housing made of elasticity resin can be equipped easily, and after use can be easily removed from a leukopheresis machine.